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Hon. J. E. Michaud - Minister

SURVEY OF THE MACKEREL TRADE IN EASTERN CANADA

by

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Foreword

This report was presented to members of the Salt Fish Board in the summer of 1940. At that time, the difficulties of the mackerel trade were generally recognised, and prices paid to fishermen were so low as to yield little return on their efforts, the prices paid for pickled mackerel covering little more than the cost of salt and barrels. Since then however, a series of events have occured to change the position swiftly from depression to boom. Accordingly the release of this report in 1941 may appear as the presentation of a statement that is no longer relevant to present conditions. But to those who recognise the fortuitous nature of the present boom, the attempt to investigate some of the underlying features of the mackerel situation may still appear to merit publication even at this date.

The facts presented and the opinions expressed are the writer's selection and responsibility. The Salt Fish Board does not necessarily endorse them.

REPORT ON MACKEREL TRADE

Summary of Report.

The mackerel trade of Eastern Canada has encountered persistent difficulties in the decade following 1930. Returns to the fishermen have steadily declined, and by the summer of 1940 these were barely sufficient to cover the costs of the salt and the barrels used in preparing the "spring" mackerel for market.

This critical condition is the result of a two-fold pressure on prices. On the one side the catch, apart from vagaries in the "run" of the fish, has been mounting to new levels, well above those that ruled for over thirty years. In each of the years 1938, 1939 and 1940 the catch approached the high levels that existed in the 80's of last century. On the other side, the price that could be got for pickled mackerel in the main market (Jamaica) was being consistently forced downwards as prices of codfish fell. The international price of dried salted cod was persistently low after the depression, and in Jamaica in particular Newfoundland was selling lower qualities of codfish, at relatively low prices. Mackerel prices had to conform to this. This was occuring at the time when mackerel landings were reaching record levels. These two factors between them accounted for the steady pressure downwards on mackerel

prices received by fishermen.

Each of these conditions is the subject of parts of this report.

The production conditions are traced, particularly the conditions after 1926 when the upward trend in mackerel seems to begin. This upward trend of production in landings must be associated with one (or both) of the following conditions (a) an increase in the number of fish available for capture in any year, and (b) an increase in the effort devoted to their capture. That there was an increase in the fertility and survival of certain mackerel broods seems evident. But it seems apparent also that there was, particularly in some districts, increased efforts at capture, on the part of fishermen themselves. During a critical period in some localities - critical because codfish returns were low, and lobsters could not be found in sufficiently ample quantities - mackerel began to run in larger quantities. Mackerel prices too were falling, but if they could be landed in sufficient quantities, they could help to hold up income. From the fisherman's point of view income from any variety is not dependent only on its price per unit, but also on the chances of capture. In mackerel the chances of capture were rising, showing abundance first in 1933. So long as the

the fisherman's increase in catch was greater than the subsequent fall in price, it was profitable to produce more mackerel. And that movement was likely to continue until the price per unit fell sufficiently throughout Eastern Canada to offset any possible rise in income through increased landings. That point apparently was reached, in the summer of 1940, in some districts in particular. The mackerel problem therefore cannot be divorced from the general problem of the shore fishery: the increased mackerel production in the 30's is not unconnected with the low prices available for other fish, and with the lower chances of capture of these other fish. Mackerel prices were also low, but with nature's unusual bounty in this variety, income could be got so long as the price covered something more than the cost of salt and barrels.

The other phase of the study is concerned with the market for pickled mackerel. In studying the demand for pickled mackerel in Jamaica, attention was given to the experiences in the years 1932-40, and since dried cod and pickled alewives were competitive with mackerel, they were included. The statistical enquiry measured on average, how a given change in price for each fish affected the demand, and how in turn a given change in demand affected price: secondly the effect of a given

change in the national income of Jamaica on their demand for each type of fish was also measured.

The study of the effects of price changes on the amount demanded showed that in none of the varieties did the demand expand significantly as price fell. Economists would say that the demand for dried cod, and for pickled mackerel and for alewives was inelastic. Mackerel responded least of all. A 1% fall in price brought on average only a 0.5% increase in the quantity consumed. In the case of cod and alewives, there was a little more elasticity shown for a 1% fall in their price brought in each case a 0.7% (approximately) increase in consumption, on average.

The study of the effects of income changes on the Jamaica demand for fish likewise revealed no significant movement in demand. Again mackerel was least affected, and indeed showed, on average, no tendency for demand to rise or fall as income changed. Both cod and alewives did respond however. A 1% rise in national income was associated with a 0.4% rise in consumption of both cod and alewives. Oppositely a fall in income was associated with a fall in demand for cod and alewives while mackerel on average was unaffected by income changes.

So far as mackerel was concerned, the conditions of 1932-40 showed that demand was inelastic, and therefore

that a small catch (since Jamaica was the only significant market) was more profitable than a large one. It showed moreover no tendency for mackerel consumption to vary in response to income changes. There had been a great increase in consumption in the 20's as mackerel had displaced herring, but from 1932 onward, when consumption habits seemed to have been more stable, mackerel consumption depended on price mainly, and not at all on income, as did cod and alewives. Thus in good trade years in Jamaica, cod and alewives demand rose as against mackerel: in depression years, oppositely, the demand for mackerel stood up better to the depressed conditions.

But the demand for any one variety - except cod - could not be completely explained by reference only to its price and to the level of income. In the case of mackerel, it was in competition with cod, and so mackerel sales could be affected by changes in cod prices, even when mackerel prices were unchanged. Similarly alewives were in competition with mackerel, and alewive demand rose when mackerel prices got out of line. Hence the study had to attempt to measure these interrelations of demand.

This phase of the enquiry, based on the average findings of the years 1932-40, showed that cod and mackerel were more competitive than mackerel and alewives.

When cod prices altered (in response to world changes in this commodity), mackerel prices moved very closely in step: their correlation was very high. But alewive prices did not line up in the same way: they were less competitive. (The fact that the prices of two such goods move together - that is that the ratio between them is nearly constant - is evidence of a high degree of competitiveness: it means that a small price rise in one relatively to the other is apt to result in a big switch of consumers to the cheaper product. To prevent this, the price ratio must keep almost constant in highly competitive goods).

This degree of competition was measured for this period. It showed that on average, when the price of cod rose by 1% relatively to mackerel, there followed an increase in mackerel consumption above cod of 1.6%, i.e. the transfer of consumption to the lower priced was more than in proportion to the rise in price of the other. As between mackerel and alewives, the switch was less significant. If mackerel rose in price by 1% above alewives, there was only a 1.1% increase in alewive consumption relatively to mackerel. This too was more than proportionate to the price change, indicating that consumers regarded mackerel and alewives as substitutes. But their competition was less keen that that between cod

and mackerel.

Changes in income in Jamaica also affected the competition between them. A 1% rise in national income was associated with a 0.2% increase in cod consumption as against mackerel, and a 0.3% increase in alewive consumption as against mackerel. Oppositely when income fell by 1%, the percentage gains were in favour of mackerel.

If the consumption habits of Jamaica persist as they did in the 1932-40 period, there is little there to suggest a solution to the mackerel difficulty. It is however to be noted that an improvement in the technique of Canadian marketing, and in particular a cessation of the present practice which unloads most of the catch in the autumn at low prices, and then follows with short sales and high prices in the spring, could steady the monthly price and help to promote steady consumption habits. The war situation might induce changes in the prices of other foodstuffs with which mackerel goes to make up a 'dish' and so redound to the advantage of this trade, or again the war may so strengthen codfish prices that the problem is temporarily removed. Nevertheless it is necessary to recognise the facts of over-production of mackerel in Canada, and also the relative cheapness of Newfoundland cod in Jamaica as the causes of the mackerel problem between 1930 and 1940.

SURVEY OF THE MACKEREL TRADE IN EASTERN CANADA

Present Position 1940.

The present situation reveals considerable distress in this branch of the Canadian Atlantic Fishery. The difficulty is evident in the low prices being offered to fishermen for pickled mackerel, the main outlet for the mackerel catch. At present (September 1940), prices have been as low as $3.50 per barrel. The attempt of exporters to organise themselves against distress selling, consignment sales and other practices that induce price-cutting, is evidence of the need felt by them for remedial action.

The immediate cause of the difficulty is the large supply of "spring" mackerel available. The carry-over from the 1939 season was about 12,000 barrels, probably an easy record. The 1940 "spring" catch, reports the Department of Fisheries, will yield only 38,000 barrels as against 42,000 last year, but this low estimate for this year is questioned by dealers in the trade, who forecast at least 45,000 barrels for the 1940 season. According to these estimates, the disposable amount is between 50,000 and at least 57,000 barrels.

The second factor affecting the position is the economic condition in Jamaica, the main outlet for "spring" mackerel. In the first half of 1940, her economic condition was unfavourably affected by the hurricane of

last November, and her exports were off by 40% from 1939. This affected her purchasing power. In this connection prospects are now improved somewhat, although the prices of sugar and coffee are not particularly encouraging. More important perhaps than the economic condition in Jamaica is the price ruling there for the substitutes for mackerel, particularly for other cheap grades of fish, like Labrador fish from Newfoundland. The prices for these have been relatively low, and any further contraction of the usual outlets for Newfoundland fish, would increase the competition between mackerel and Newfoundland fish in this market. Oppositely, any expansion of Newfoundland's outlets in Europe would harden codfish prices in Jamaica as elsewhere in the West Indies, and would strengthen Canada's mackerel market in that particular island.

A full analysis of this trade requires some attention on the underlying or long-run conditions. Discussion may proceed by investigating the conditions of production of mackerel in Canada, and following this by enquiry into the marketing.

In the discussion of production, we shall find it advisable to consider the "summer and fall" production, as well as the "spring", because from the production point of view, they have common features. In the section on marketing, we shall confine ourselves to "spring" mackerel

and neglect the "summer and fall", which find their market mainly in the U. S. A. All mackerel have common production features, but from the marketing point of view, "spring" is really a different commodity from the "summer and fall" production, with different outlets.

PRODUCTION OF MACKEREL

Enquiry into this phase of the subject may proceed by giving first a general survey of mackerel production and manufacture in Eastern Canada since the last war. This can then be followed by a consideration of the technical distribution of the production as between the "spring" and the "summer and fall" catches, and also of the regional distribution of production as between St. Margaret's Bay (N. S.), the Magdalen Islands, etc.

It should be remembered that statistics on production have many imperfections at present.

It is true that the published figures are extensive enough, covering as they do regional production and manufacture (whether used fresh, filleted, pickled, etc.), as well as the instruments of production available in the region. But there is evidence that the quantity of statistical material has been extended without an equal emphasis on their quality. Furthermore in the case of mackerel it is impossible to distinguish between the "spring" and the "summer and fall" production, despite the fact that these are technically different commodities, with different possibilities of manufacture, different markets, etc.

On such material no exact statistical reliance can be placed: nor does the material merit any refined statis-

CHART I.

Canadian Mackerel Landings and
Export Prices of Pickled Mackerel
- 1880 to 1940 -

tical technique. It can be used only as a rough indicator.

From the production point of view, the most striking feature of the current period is the abnormally large quantities of mackerel being landed. In three successive seasons in the Canadian fishery, 1938, 1939, and 1940, the quantities of mackerel captured have exceeded any annual catch in the past forty years. The chart opposite shows the annual landings since 1880. In the 1880's the catch was large but the tendency was down to a new level: it fell from seventy million lbs. in 1880, to eight million in 1897. From then onwards it fluctuated around the new low level - which came to be considered "normal" - with catches ranging between ten million, and twenty-five million lbs. But from the last low point (1926), the catch has risen with some consistency until during the last three seasons, it has achieved the levels of the 1880's.

To complete this general statement of the background to the present position, the annual average export prices have also been charted. It will be noted that the prices rose from around $10 per bbl. to $15 as supplies became scarce in the 1880's. Then followed a period of remarkable price stability almost up to the last war, a stability that persisted yearly despite very great fluctuations in annual landings. The abnormal war prices require no

comment. From then up to 1930, the price fluctuated around $10 per bbl. again, but it should be noted that from 1922 to 1930, the landings were off somewhat. Following 1930, a new low level of prices emerges, averaging around $5.00 per bbl. This fall in the general level by 50% was partly attributable to world depression, but partly also to the new high levels of catch. Not only was catch high in the last three years, but even 1933 was a record for this century: and the low year, 1935, yielded sixteen million lbs. which is almost equal to the average annual catch for this century. The high catches were forcing export prices down again towards the deep low point in 1933.

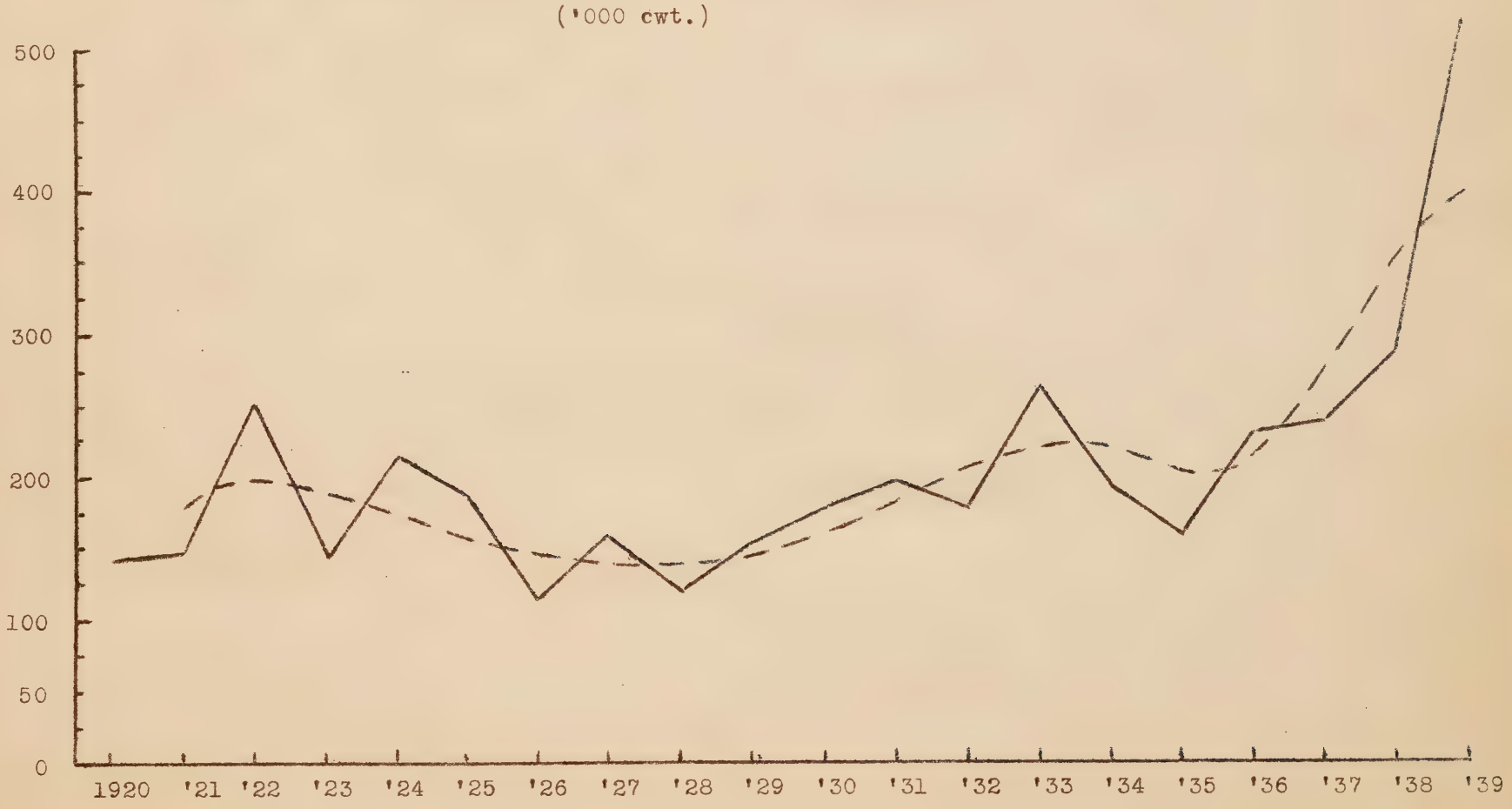
To show the production position in more detail, a second chart is given, with the total mackerel landings in Eastern Canada from 1920 to 1939 (1). It is drawn as a continuous line despite the fact that production is not continuous through the twelve months of each year. A better diagram would be one of blocks, a block representing each year's catch. The line of the following may be considered as one joining the tops of each block representing each year's production.

Through the series a dotted line has been drawn, and it may be termed the "trend" of the series. It neglects

(1) See Statistical Appendix 1 for figures of landings.

Chart 2.

Total Quantities of Mackerel Landed in Eastern Canada, 1920-1939.



Source: Fisheries Statistics of Canada, 1920 to 1939.

the annual peaks and troughs caused by big or short "runs" of fish, and changes in the intensity of mackerel fishing, and this trend represents the gravitational slope or axis of the series as a whole.

It will be seen that the trend was downwards to 1926. Thereafter, it rose steadily to 1933, when a downward dip interrupted the upswing, but the rise was resumed after 1935, becoming very steep up to 1939, which marked a record production for this century. It may be stated at this point that the record production of 1938 and particularly 1939 was due, not to greatly increased "spring" catches, but to new intakes of "summer and fall" mackerel.

The first fact to be established about mackerel landings, as a whole is the more or less persistent rise in the trend of production since the end of the 20's. There have been yearly variations upwards and downwards according to the "run" of the fish, and according to the fisherman's expectations of the price he is likely to get in any year, but the underlying movement has been a steady upward rise in the catch, showing, even in 1940, no marked diminution.

An explanation of this marked upward trend - hardly paralleled in any other type of fish landed by shore fishermen merits some enquiry. The variation in the annual catch is, of course, due to two factors (1) the "run"

of the fish in the waters of Eastern Canada. (2) the fishing effort devoted to the capture of this particular type. The first factor -including the state of weather at the time the fish are available - is outside the fisherman's control: the latter factor is dependent on his action. The amount of gear used, the state of its efficiency, and the frequency of its use (weather apart) is dependent on the fisherman's own economic position. Apart from income that he may derive from lumbering, farming, road work or any such, the fisherman in any locality has some choice as to the distribution of his effort between the capture of different kinds of fish. In some localities the choice is more limited than in others, but within the limits set by the kinds of fish available at any season, the fisherman has alternative opportunities, and it is to be expected that he will apply himself to the types which seem to offer the higher relative returns. This limited choice has to be made early in the spring, and so the prices that ruled for the previous years' catch of cod, scale fish, mackerel, etc. etc. have some influence in determining his eagerness to apply his effort more to this or that type. Furthermore if he has to purchase new gear at the beginning of the season, and if he has to seek credit, the merchant may be more willing to grant credit for the purchase of that type of gear which will land fish that are, or

recently have been, relatively better priced, than he will on gear for capturing fish which have shown relatively low prices in the previous season. Accordingly, the relative prices that ruled for fish in the past season have some effect on the fisherman's choice of alternatives, and also on the willingness of lenders to provide the specific type of equipment required. In other words, the economics of the different types of commodities called "fish" have much to do with the seasonal effort devoted to the production of each different type - although, as is obvious, all types of fish are not equally available in all regions of the shore, and so effort is devoted, not necessarily to those types that are generally the most economic, but to the most economical types available in that locality.

Since this is so, and it is true for every region, to some extent, because even if many types are available, the capture of some is relatively more difficult, it means that the fisherman's choices as to effort depend not merely on the relative prices of the types available in his locality, but on the relative difficulties of capture of the different types. Fish A may provide a price twice as high as Fish B, but if he can catch three times as many of Fish B as he can of A with the same effort, he will devote more effort to B, despite its lower unit

price. In other words, to maximise his season's income, the shore fisherman has to form some expectation as to possible prices of different types, and also to the relative chances of capture of these different types. This last factor cannot be forseen (at least with present knowledge of fish habits, etc.), but there is in each locality some more or less vague idea of an average or normal landing of each type, and it is on this basis that choice has to be made.

Choice of course is not completely free each spring, because the fisherman will be already committed to certain costs. He will have various types of gear available, and this will affect his actions even if some particular types of gear will land fish that were relatively more economical when the gear was purchased than they now are. With his present levels of income, he will be inclined to persist in the use of that gear until it is completely worn out: complete depreciation rather than obsolescence is the signal for the search for new equipment. Accordingly, there is quite a lag in adjustment on the part of most shore fishermen. If some particular type of fish has become relatively profitable, and there are many additions of specific gear to land that fish, it is likely that the landings of that fish will remain high, even if it becomes relatively less profitable than some

others: the landings will remain high until the gear is worn out or lost. (Different types of gear wear out at different rates: some is more prone to loss through bad weather than others: some can be used for landing different types of fish. All these factors mean that adjustment to changing conditions in the economics of different kinds of fish is a variable condition).

It is against this general background that the recent rise in mackerel production has to be considered. As already noted, fish landings depend on two factors, - the number of fish available for capture in any season, and secondly the effort devoted to that capture. In the case of mackerel, the first factor (which in turn depends on the natural reproductive rate of this fish and on the relative ability of any single year's brood to survive and mature) is perhaps a more important determinant of the size of the catch than the fisherman's efforts at capture. The nature of the information, at our disposal makes it impossible to assess the weight of each variable, to say for example that the catch depends 60% on the "run" of the fish and 40% on the fishermen's efforts. Nevertheless, the economic factor, as it affects fishermen's efforts, has been of considerable importance in the Canadian landings of recent years. This circumstance is evident from a review of the rise in production itself.

It has to be stated, as a point of departure, that this rise in production has not been common to all the mackerel-producing regions of the Canadian Fishery. In some, the production has, apart from annual vagaries of the "run" of fish, remained relatively constant over the past twenty years; in others, the trend has even been downwards; while in others it has risen steeply enough to throw up the total catch for the fishery as a whole. The most marked increase in production has been in the St. Margaret's Bay (N. S.) region (roughly from Pennant Point through St. Margaret's and Mahone Bay): In Richmond and Inverness counties (N. S.), the trend has been upward, but less steeply. In the Magdalen Islands, the trend has been relatively stable: in New Brunswick, and in Guysborough County (N. S.), the trend has been downward. The net effect has been to concentrate the total production more and more in Nova Scotia, and particularly in the St. Margaret's Bay region. The following table indicates roughly the change in the distribution of the whole catch.

DISTRIBUTION OF TOTAL MACKEREL CATCH

	1923	1930	1938	1939
Nova Scotia	56	73	80	84
Quebec	33	18	14	9
New Brunswick	9	3	2	2
Prince Edward Island	2	6	4	5
TOTAL	100	100	100	100

This indicates the growing significance of the Nova Scotia production: it now produces four-fifths of the total catch, and St. Margaret's Bay alone provides nearly 40% of the whole Canadian catch, (Richmond County, 9%, Guysborough, 6%, Inverness, 6%, etc.).

The first point to be borne in mind is that the rise in the trend of catch has not been equal in all mackerel-catching regions.

The second point is that this steady rise in trend of mackerel production - without comparable rises in any other types - has occured while the price of mackerel has fallen relatively to all other main types of fish.(1) Since 1926, the rise in production has been greater, and the fall in price greater than in other types.

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(1)

		1926	1930	1935	1938
Price Changes	Mackerel (pickled)	100	80	52	46
(Base 1926:100)	Alewives (")	100	82	59	53
	Codfish (Dried)	100	92	65	67
	Codfish (Boneless)	100	100	79	81
	Hake & Cusk (Dried)	100	72	71	71
	Pollock (Dried)	100	105	64	72

These figures are based on the average prices paid to fishermen in Nova Scotia. They are so far as mackerel goes, representative of the prices paid to all mackerel producers, whether in Nova Scotia or elsewhere in Eastern Canada.

In short, the trend of mackerel production (apart fromannual fluctuations in landings) has been consistently upward in some regions, while the price trend has been consistently downward. The regions of upward trend - St. Margaret's Bay area, Inverness County, Richmond County in Nova Scotia, and Queens (P. E. I.), all happen to be areas in which mackerel has always formed a large proportion of fishermen's income, areas in which, for different reasons, there have been fewer alternative fishing occupations than in some other parts of the coast. In St. Margaret's Bay in particular, where the increased production has been most marked, they had always been dependent for about half their "fishery" income on mackerel and herring: lobsters were the next main source, yielding in the 20's, almost 15% of their income from landings: cod was the next source. As the income from codfishing fell (from $131,000 in 1928 to $23,000 in 1938), the possible alternatives in fishing were in lobsters and mackerel and herring. Increased efforts on lobsters would not yield much additional income since their quantum was so definitely limited. There was little possibility of expanding income from herring, for it was in competition with mackerel, returns were lower and costs about the same, and anyway consumers' tastes were definitely away from herring. There remained mackerel.

During this critical decade in the fishery, it happened that mackerel began to run in larger quanties in certain districts. The first sign of the change came in 1933, following the year of lowest prices men could remember. In 1933, the price was still lower, but the increased catch in some regions more than offset the lower price, and income from mackerel rose. It was, a reminder that from the fisherman's point of view, income is determined not merely by the price per unit, but also by the chances of capture. In mackerel, the chances of capture were on the uptrend. So long as the increase in catch was greater than the subsequent fall in price, it was profitable to produce more mackerel. In St. Margaret's Bay, more efforts were devoted to its production: in 1930, gill nets used in the region were 7500, but were up to 8500 by 1939: trap nets rose from 214 to 245: men fishing in boats for mackerel rose from 275 to 485. However accurate the statistics, they bear out the logical expectation. The following table shows the landings and income from mackerel in this period in St. Margaret's Bay.

St. Margaret's Bay

	Mackerel Landings (cwt)	Price per cwt.	Value of landings ($)	"Landed" income per man ($)
1928	22161	3.51	77785	---
1929	16191	3.10	50192	---
1930	32389	3.15	102025	---
1931	36216	2.28	82572	---
1932	38580	0.99	38194	139
1933	108107	0.61	65945	169
1934	60040	1.16	69646	324
1935	39189	1.30	50945	154
1936	66125	1.07	70753	166
1937	60390	2.09	126215	291
1938	104430	1.23	128448	265
1939	225265	0.84	189400	390

Between 1937 and 1939, the catch in this region rose abnormally, and the conseqnent fall in price was great. But despite the fall in price, values rose, and the calculated income per man rose to new high levels. Mackerel was yielding almost 70% of the income from landings in this district. The unusual quantities of mackerel available were maintaining income. Since relatively little was used fresh, the catches did not quickly depress prices and discourage intensive fishing. In some years, despite the fall in price, mackerel income rose. This was true, to a lesser extent, for some other regions as well as the above. But this process of

of expending production was gradually bringing a new problem of disposal of the catch: the main outlet was pickling, but that market was showing signs of saturation before 1937: alternatives were to use more mackerel fresh, or as fresh or salt fillets, or as bait - outlets which were not however possessed of much absorptive capacity. The search for expansion of these increased after 1937, but production expanded more rapidly than these outlets.

The crisis in the mackerel situation was slow to reveal itself. In the case of lobsters, their natural scarcity soon revealed - in some areas particularly - that additional fishing for them could not produce volume. But that was not true in mackerel; the effect of additional fishing did produce volume, and did look good to the fishermen: it brought low prices, but these he attributed to world conditions, to the merchant system, or to some such factor: the effect of the large volume was shown only through price falls, which were often not evident until after the "run" was over and these falls were not always directly attributable to the size of the catch, in the fisherman's view. But the crisis was inevitable and would come whenever he had produced a volume that seemed likely to yield a fair income: that volume came in 1939-40 seasons, leading in the end

to inadequate prices, great carry-over, and a threat of having two years' supply available.

In itself the mackerel situation at present is only part of the general problem of the shore fishery, the problem that arose when the codfish trade became unremunerative. The fisherman could turn to substitutes in some regions; where he couldn't, his position has been critical for some time. But where substitutes were available the crisis could be deferred, at least until the new levels of production in the substitutes forced down returns to the level of the other branches. In the case of mackerel, that has taken time: but it is now present. The critical position of the shore fisherman, irrespective of the choices open to him, has become more nearly complete. The mackerel position cannot be isolated from the general position of the shore fishery.

This short review of the production conditions can be concluded by reference to two connected phases. One is the distribution of the catch according to season. This is important in so far as the "spring" mackerel is really a different product from the "summer and fall" mackerel. The "fat"mackerel, caught later in the season have greater technical possibilities than those caught in the spring, and can be used for different pusposes and in different markets from the "springs", which have to be pickled and which find their main market in the West Indies.

(1) THE "SPRING" AND "SUMMER AND FALL" CATCHES

As nearly as we can judge by perusing the monthly reports of the Department, the total catch in Eastern Canada, was divided as follows:

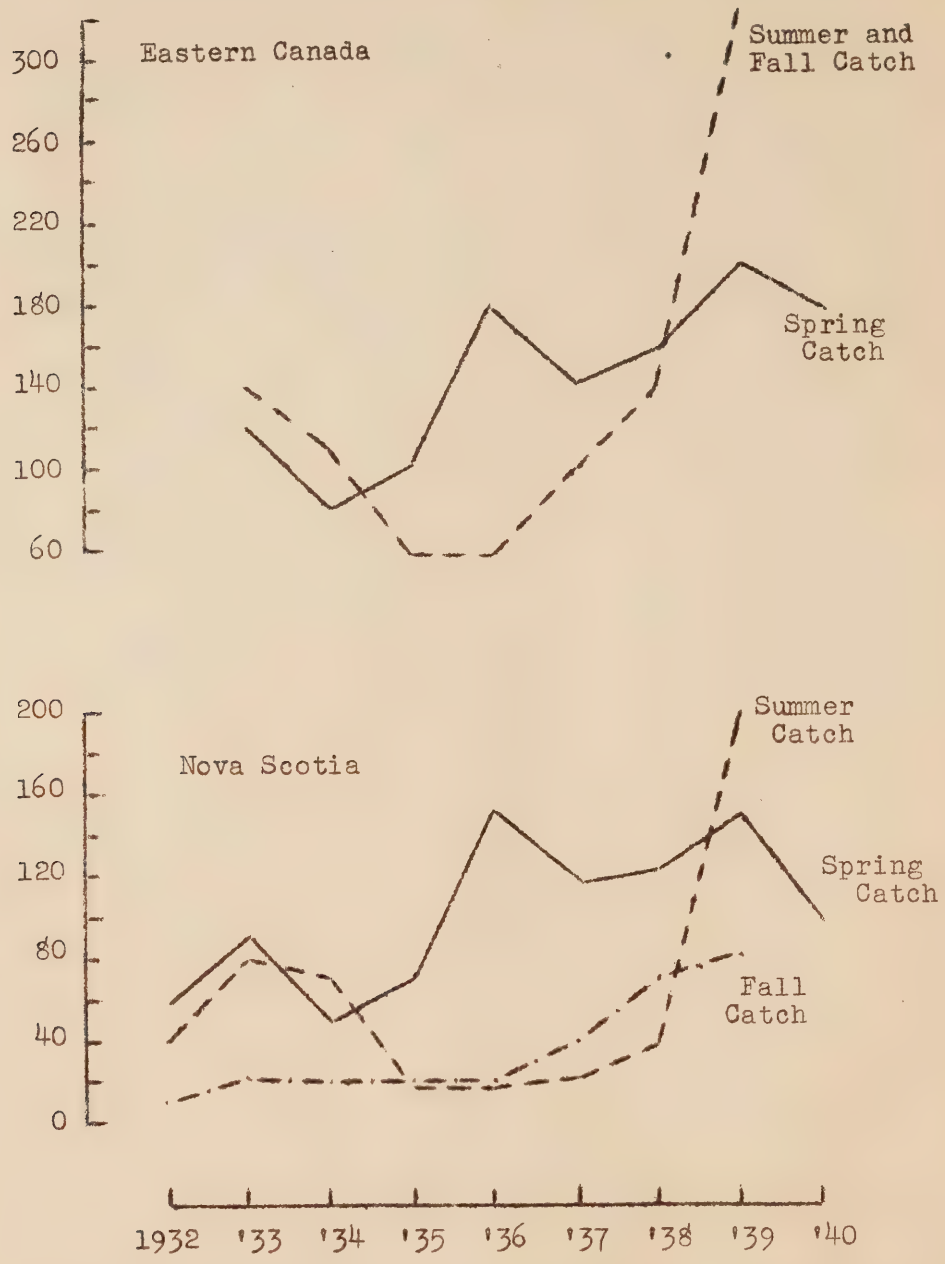
	Spring Mackerel (cwt)	Summer and Fall (cwt)	Total Catch (cwt)
1933	121868	141448	263316
1934	79082	111736	190818
1935	104738	55757	160495
1936	173950	53688	227638
1937	146197	92966	239163
1938	155501	130064	285565
1939	194326	326325	520651
1940	172327	------	

These figures suggest that the proportion of the total caught in spring and in summer varies considerably, e.g. in 1936, the spring catch amounted to 76% of the total, whereas in 1939, it was only 38%, and it ranged between these two limits in the other years for which we have data. Apart from the exceptionally large summer and fall catch in 1939, the "springs", during the 20's and 30's, averaged about 60% of the total catch.

Chart (3) reveals the steady upward rise in the spring catch, with its peaks in 1933, 1936 and 1939.

Chart 3.

"Spring", "Summer" and "Fall" Mackerel Landings.
('000 cwt.)



Source: Fisheries Statistics of Canada, 1932 to 1939.

Since between 70% and 80% of this catch was landed in Nova Scotia, it follows that it was there that most of the fluctuation was present. In fact the Magdalen Islands' production was fairly stable until 1940 when it suddenly jumped, and constituted almost half the total spring catch.

The chart reveals also the apparent lack of regularity in the summer and fall catches. From their peaks in 1933, they fell to 1936, then began a recovery. In 1939, the summer catch was near its 1933 record, but the fall catch was also a record so that their combined total produced a quite unusually large catch. So 1939, brought as had 1933, a combined peak in both spring and summer catches: but 1939, with its record "fall" catch constituted records for all seasons. This was a more serious matter than the high catches of the only year that was comparable (1933) because the new records were superimposed on a general trend that was well above the 1933 point, and the new records were achieved with several years of carries-over in production as a background. The record summer and fall catches were almost entirely attributable to the Nova Scotia production.

With the summer and fall catch on the other hand, there is no suggestion of cyclical runs and we have no data available here to carry us backwards from 1932.

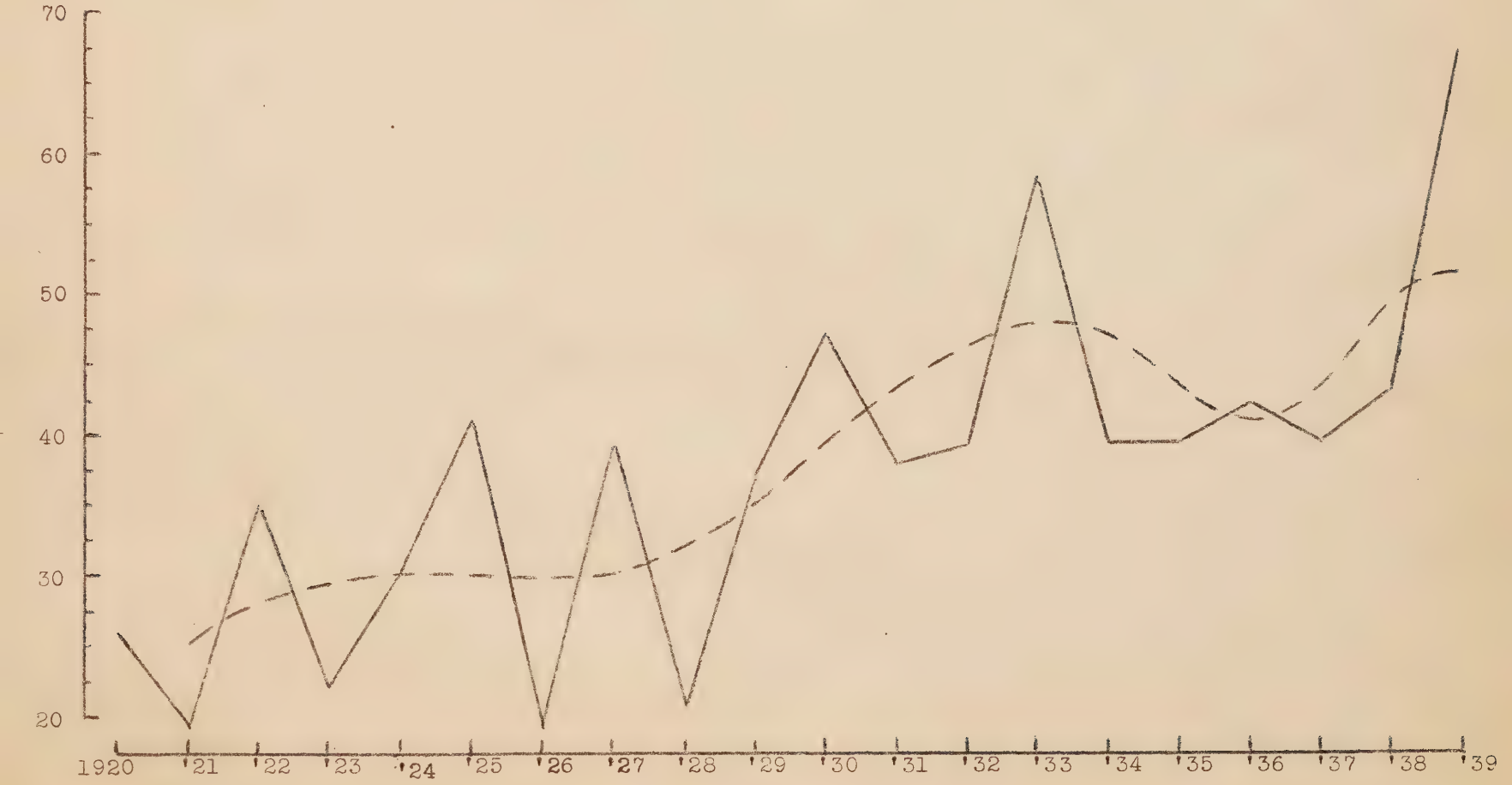
In trying to distinguish between the summer and fall catches, there is the statistical difficulty that the 'run' of these fish does not happen to coincide with the calendar months - which are all that are available to us statistically. However, measuring the "summer" catch as in July and August, and the "fall" catch in September - December, it appears that the "fall" run has seen less wide fluctuations than the "summer" run. In Nova Scotia, the summer catch fell from a peak of 80,000 cwts in 1933 to 12,000 in 1935 and 1936, then recovered slowly in 1937 and 1938 before rising fantastically to 196,000 cwts in 1939 - more than twice as high as the previous peak (1933). It is this more than the spring and fall catch, which pushed up the 1939 production of all mackerel to the high peak shown in Chart 1.

Fall mackerel remained almost stable for 1932-1936, but then rose from its average of 20,000 cwts in this period to 84,000 in 1939 - another striking rise but not confined to one year, as in the summer catch: the fall rise was steady.

Chart 4.

Total Production of Pickled Mackerel in Eastern Canada, 1920-1939.

(in thousands of barrels)



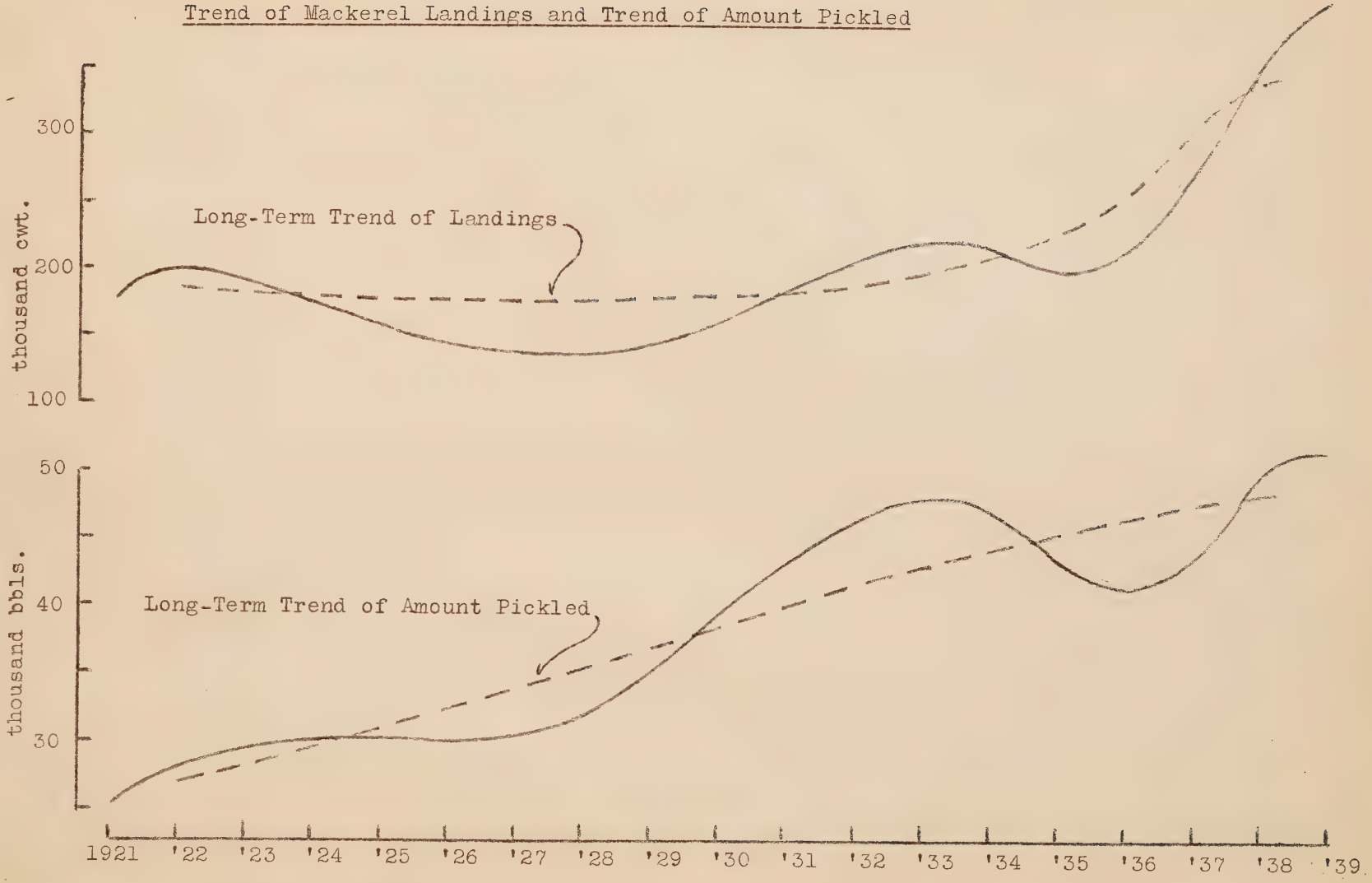
Source: Fisheries Statistics of Canada, 1920 to 1939.

(2) THE "PICKLED" MACKEREL TRADE

The proportion of the total mackerel catch that was pickled has varied over the past twenty years, the proportion tending to rise from 1921 to 1930, when it steadied itself, and then since 1935, the proportion pickled has tended to fall off. It is, of course, true that in any year the proportion pickled will depend to some extent on the nature of the catch itself: on whether the total catch is made up mainly of spring mackerel. If the catch is comprised mainly of "springs" then the technical nature of the commodity limits the possibility of using it for other than the pickled trade, and indeed in such an instance the main outlet for such "leather-bellies" is Jamiaca; if, however the catch has a large proportion of fat summer and early fall mackerel, additional outlets are available, and the manufacture of fresh fish, or fillets becomes a new possibility: furthermore the pickling of such fat mackerel is for the higher grade U. S. A. market, and this outlet for fat mackerel is in turn dependent on American conditions, and particularly on the run of mackerel in United States waters, or the surplus available from their fresh fish trawls, etc. It is the total of such conditions that determines the outlet for mackerel. But apart from this, it is true

Chart 5.

Trend of Mackerel Landings and Trend of Amount Pickled



Source: Charts 1 and 6.

to say that in the early 20's, there was an increased concentration on pickled mackerel. Chart (4) shows the production of pickled mackerel in Eastern Canada.(1)

The trend was up slightly to 1925, then rapidly from 1927 to the early 30's, after which it fell low till the record catch of 1939.

It is of some interest to compare the above trend of pickled mackerel production with the trend of the mackerel catch, as shown in Chart (2). These two trends are compared in Chart (5), and to aid comparison another trend line has been drawn through each to show the underlying drift of the trend of each series. It will be seen that while the axis of the catch has been steadily upwards, and at a rate that seems steadily increasing, the slope of the pickled production was steep up to the early 30's, since when it has tended to flatten out.

This flattening out suggests that the pickled markets were approaching capacity in the late 30's, but as fishermen continued to intensify their fishing efforts on mackerel, new outlets or new uses for mackerel had to be found. This suggestion is borne out by other evidences - e.g. the flattening out of Jamaica's consumption of mackerel in the 30's which we shall discuss later. Again,

(1) See Statistical Appendix (11).

this flattening of the pickling trade (in other words the fall in the proportion of the catch that was pickled) is clear also if analysis is made of the attempts to utilise mackerel for other purposes (1). The possibilities were not equally available to every region: e.g. in Richmond, the catch was put up mainly as pickled, for there were few alternatives. But in St. Margaret's Bay, there were attempts to increase the sales of fresh mackerel, while in the Magdalens, where this possibility was limited, attention was given to the production of salt fillets. Without pushing this too far, it is sufficient to state that a survey of the manufacture of mackerel in the late thirties indicates clearly the growing saturation of the pickled fish market, and the attempts to get rid of the growing catch as fresh, salt fillets, bait, canned or smoked. None of these outlets seemed to provide an immediately profitable method of utilising the growing catch, and in 1939, the record year of catch, there was put up a record pickling, which brought the crisis to a head; there was also a new production of salt fillets, many of which still overhang the market at this date, and there was a record utilisation of mackerel for bait. The outlets did not prove encouraging, although it is by no means proven that each was conscientiously and painstakingly

(1) See Statistical Appendix (111), which shows the various types of manufacture of mackerel since 1930.

Chart 6.

Pickled Mackerel: Average Prices Received by Fishermen (Eastern Canada)
(in dollars per barrel)

investigated.

The other, and the main indication of the pickled mackerel situation is to be found in the price structure. Again this is probably best seen by a chart. Chart (6) shows the average prices received by fishermen for pickled mackerel (price per barrel).

The fall is catastrophic, and now gets near the level at which the price received is barely adequate to cover more than the cost of salt and barrels.

There are several small features of the price structure of pickled mackerel that are worthy of mention. One is that there is some evidence, especially in the 20's that the trade experienced the "run-around" that was characteristic of certain agricultural commodities. That is, if the price rose in one year, it tended to encourage a greater production in the following year. But the higher production of the second year lowered prices in the second year, thereby tending to reduce production in the third year. This tended to raise prices again in the third year, thereby inducing a repetition of the "run-around". In the case of mackerel, it was not merely a matter of annual variations in landings leading to similar variations in the amount of pickled mackerel produced. But it happened that the proportion of the catch that was pickled, underwent

variations, and this proportion responded to the prices prevailing in the previous year. When prices were strong in one year, they encouraged an increase in the proportion that was pickled, regardless of the size of the catch. For example, in 1924, 42% of the catch was pickled, and the average price of pickled mackerel was high ($12.92 per barrel). This seems to have induced a larger pickling in the following year, when the proportion rose to 66% of the catch. But at this level, prices were only $8.30 per barrel. Following this low price, the proportion pickled fell to 50% in 1926, but now price jumped to $10.80 per barrel. So again in 1927, the proportion pickled seemed to respond, for it rose to 74%, but again price dropped, this time to $9.64. Accordingly in 1928, we find, as we expect, that the proportion pickled is down again, now to 53%. This short supply meant another high price of $11.60, which in 1929, induced another expansion of proportion pickled, which rose to 72%.(1)

After 1930, there is less evidence of this connexion, presumably because the price of pickled mackerel was consistently low up to 1939, and production had become less a matter of response to price conditions.

(1) See Appendix (IV).

(2) Marketing of Mackerel.

This section is confined to the discussion of "Spring" mackerel.

The main outlet for Canada's production is the island of Jamaica: only small amounts are exported elsewhere. Accordingly this part of the enquiry has to begin with a review of the demand for pickled mackerel in Jamaica.

Jamaica buys almost all of her mackerel purchases from Canada, a circumstance that has induced some members of the Canadian trade to speak as if they were monopoly sellers of mackerel in Jamaica. In a limited sense only is this true. It is true that Canada has no competition in the Jamaica mackerel market, but it is equally true, and more significant, that mackerel has to compete with other fish, and other foodstuffs, for a share in the household budgets of the Jamaica consumers. In short, the Jamaica demand for mackerel is closely associated with their demand for other types of salt fish, and also with their demand for other substitutable foodstuffs.

On imported salt fish, Jamaica has been spending about $1,300,000 in recent years: in 1930, the amount was larger ($1,900,000), but for some years now the total has been around the smaller figure. The bulk of

this (usually over 70%) is spent on dried salted cod, and the remainder on pickled fish, three-quarters of this remainder going to pickled mackerel, and the residue to alewives and herring.

Mackerel therefore is secondary to dried cod in Jamaican fish consumption, but is superior to alewives and herring. The sales of pickled mackerel on this island have expanded rapidly in the past twenty years. They rose from 9000 cwt. in 1922 to 81,000 in 1939-40, the rate of increase being rapid until 1930, after which consumption tended to flatten out[1]. This steady expansion up to 1930 was achieved under two conditions - a fall in the level of mackerel prices, and a fall in the sales of pickled herring. There was a transfer of consumption from herring to mackerel, and to alewives as well.

This history of the period 1930 to 1940 simply reinforces these movements. Herring sales from Canada, which had been over 60,000 cwt in 1920, were down to 6,000 in 1939-40 fiscal year. Mackerel, which had expanded rapidly to 1930, had flattened out, but still showed 1939-40 as a peak above any previous year: alewives were more unstable from year to year (jumping up in any year when mackerel prices got too high) but

(1) See Statistical Appendix (V)

they too were if anything, exhibiting an upward trend.

So far we have spoken of the relative shifts in these pickled varieties. It is important to look also at their absolute levels of price and quantities sold. And in this connection it is important to note that when fish prices were high (1920-27) herring was quite widely consumed in Jamaica (e.g. as late as 1925 there were more herring sold than either mackerel or alewives). And in that year herring was selling at 3.37 per cwt (F.O.B.) - more than mackerel sells for today (1940); in other words, the expansion of mackerel sales after 1925 in particular, has been at low prices, and at prices that fell down near the previous herring levels. The expansion of alewives required a similar lowering of their prices and indeed in most years they have sold under herring.

These conditions suggest that further expansion of mackerel (and alewives) sales will become difficult. So far, they have been expanded by lowering prices, and at these prices being preferred to herring. In other words, their increase was balanced by a decrease in herring rather than by any noticable change in the total market for pickled fish in Jamaica. Mackerel could still expand, presumably at expense of alewives, but this would require considerable price reduction: and

with such price reduction, it is possible only if world trade in cod kept up their price, and if mackerel could be lowered relatively to that.

So far attention has been confined to the pickled fish market in Jamaica. But in fact, dried cod is a more important competitor of mackerel than either alewives or herring - if only for the reason that dried cod and pickled mackerel between them make up over 90% of the total salt fish market there. But there is another factor, so far as Canada is concerned, which suggests concentration of attention on the competition between cod and mackerel. It is this: that if mackerel prices get out of line with those of herring or alewives, it is Canadian herring and alewives that have increased sales. But since Newfoundalnd gradually captured the Jamaican codfish market, then if mackerel prices cease to be competitive with cod, it is Newfoundland that gains the additional sales if consumers transfer from mackerel to dried codfish.

Before discussing the interrelation of the competition between cod, mackerel, alewives and herring in Jamaica, we may review briefly the nature of the demand for each commodity taken separately.

In making these enquiries into the Jamaica demand, certain limitations are present and these modify the

results, laying them open to some margin of error. In Jamaica there are no exact figures of fish consumption: the investigator has to rely on the import figures as a measure of demand. How much of a given import goes into consumption and how much into stocks in a certain period is not known and so there is room for small errors in assuming that the imports through a certain period are also consumed in that period. More important however is the difficulty arising from the lack of retail prices. The habit of selling salt fish by the pennyworth, and giving larger or smaller amounts per penny according as wholesale prices are low or high also adds difficulty. Accordingly the investigator has to rely on the c.i.f prices of different commodities as measures, rather than on the more desirable retail prices. This will not lead to serious error if the "spread" between wholesale and retail prices of cod, mackerel, etc. is fairly similar and fairly constant. Lastly, adequate statistical information on Jamaican fish imports is available for only a relatively short period. And in that period, the fish consumption habits changed from herring to mackerel and alewives. For an appreciation of the present position therefore, we have to confine ourselves to what has happened in the Jamaica fish market recently,[1] especially since 1932 -

(1) See Statistical Appendix (V1).

a period which is unfortunately statistically short, since it gives us only nine years experience or nine observations on which to base our findings. These limitations have to be accepted and recognised.

The amount of any variety consumed depends partly on the price per unit, partly on income, and partly on changing preferences and habits among the consumers.

In the case of dried cod, the demand conditions for this period showed that a rise of 1% in price was associated on average with a fall in demand of almost 0.8%. Oppositely a fall in cod prices of 1% brought a rise of 0.8% in the quantity imported. This suggested that the demand for cod was not elastic. However this average was not completely satisfactory since the demand for cod depended not merely on its price, but also on the level of income in Jamaica. When account was taken of both price and income, the result was that a 1% rise in price was associated with a fall of almost 0.7% in the quantity taken, and that a rise of 1% in income was associated with a rise of 0.35% in the quantity bought. Oppositely a fall of 1% in price resulted in an increase in consumption of 0.7%, and a fall in income of 1% resulted in a fall in consumption of 0.35%. In short, so far as cod was concerned, price changes were twice as important as income changes in

Jamaica, in determining the quantities they consumed.

In the case of pickled mackerel there appear to be some important differences. A 1% rise in their price brought only a 0.5% fall in quantity, as against the 0.8% fall in cod. The mackerel demand in this period was more inelastic than that for cod. But of more interest perhaps was the result that the demand for mackerel seemed to have no association with changes in the local purchasing power. This was borne out in each of the methods used for measuring. So far as the experience of these years shows, changes in price alone are of significance to mackerel sales, income changes in Jamaica being unimportant.

In the case of alewives however, there was some resemblance to the codfish situation. In alewives a 1% rise in price brought a 0.7% fall in consumption, which was similar to the results for cod. And a 1% rise in income brought a 0.4% rise in consumption, again resembling the response of the codfish demand to income changes. The demand for alewives was a little more elastic than that for cod or mackerel: which might be expected since it was a relatively cheap fish, able to be consumed increasingly at low prices by those who normally found fish too expensive for their budgets. Similarly changes in income in Jamaica brought an increase

in consumption of alewives, and apparently none in mackerel, again suggesting that the cheaper fish may have become an article of consumption among the very poor as their income rose a little. Oppositely of course, in years of low income, these people seemed to have passed out of the fish market again, and the sales of alewives fell 0.4% as income fell by 1%.

At the higher end of the scale stood the more expensive, and more widely consumed codfish, also increasing in consumption some 0.7% as price fell by 1%. It, like alewives, responded more to changes in price than did mackerel: again like alewives, its consumption increased as income rose. But not by quite so much as in the case of alewives - and this might be expected, since cod consumption is the largest of the fish consumptions and changes in income are less likely to affect the percentage change in consumption. Probably a rise in income, or a marked fall in cod prices does switch some consumers away from pickled mackerel: but if that occurs with a rise in income, it seems that mackerel is able to pull away some consumers from alewives, since mackerel consumption remains about independent of income.

It should be emphasised however that in the case of none of the fish consumed in Jamaica is the demand elastic, but mackerel is the least so. Furthermore in

no case is the response of consumption to income marked: but it does occur for cod and alewives, and not at all for mackerel. These are the statistical findings from the experience of the last nine years, the results in each case being based on the average of each year's import prices.

For mackerel the Jamaica demand is more inelastic than for codfish or alewives (i.e. the demands responds less to price changes). For mackerel too, income changes in Jamaica seem to have no effect on the total amount of mackerel consumed, while both cod and alewives do enjoy (or suffer) higher (or lower) consumption as Jamaica's income rises (or falls).

So far as the data go, therefore, it appears that the demand conditions for spring mackerel were not encouraging in the period 1932-40. During the period, since Jamaica was almost the sole outlet for the catch, and since the Jamaica demand was inelastic, a large catch was worth less than a small catch.(1) It is true that the demand for codfish and alewives was also inelastic; although not quite so much as for mackerel. But for these varieties, Jamaica was not the single, not even the main outlet. Therefore nothing can be deduced

(1) The Statistical analysis supports the argument of Mr. O. F. MacKenzie in "Markets for Dried and Pickled Fish" Ottawa 1938. p. 23 and p. 39.

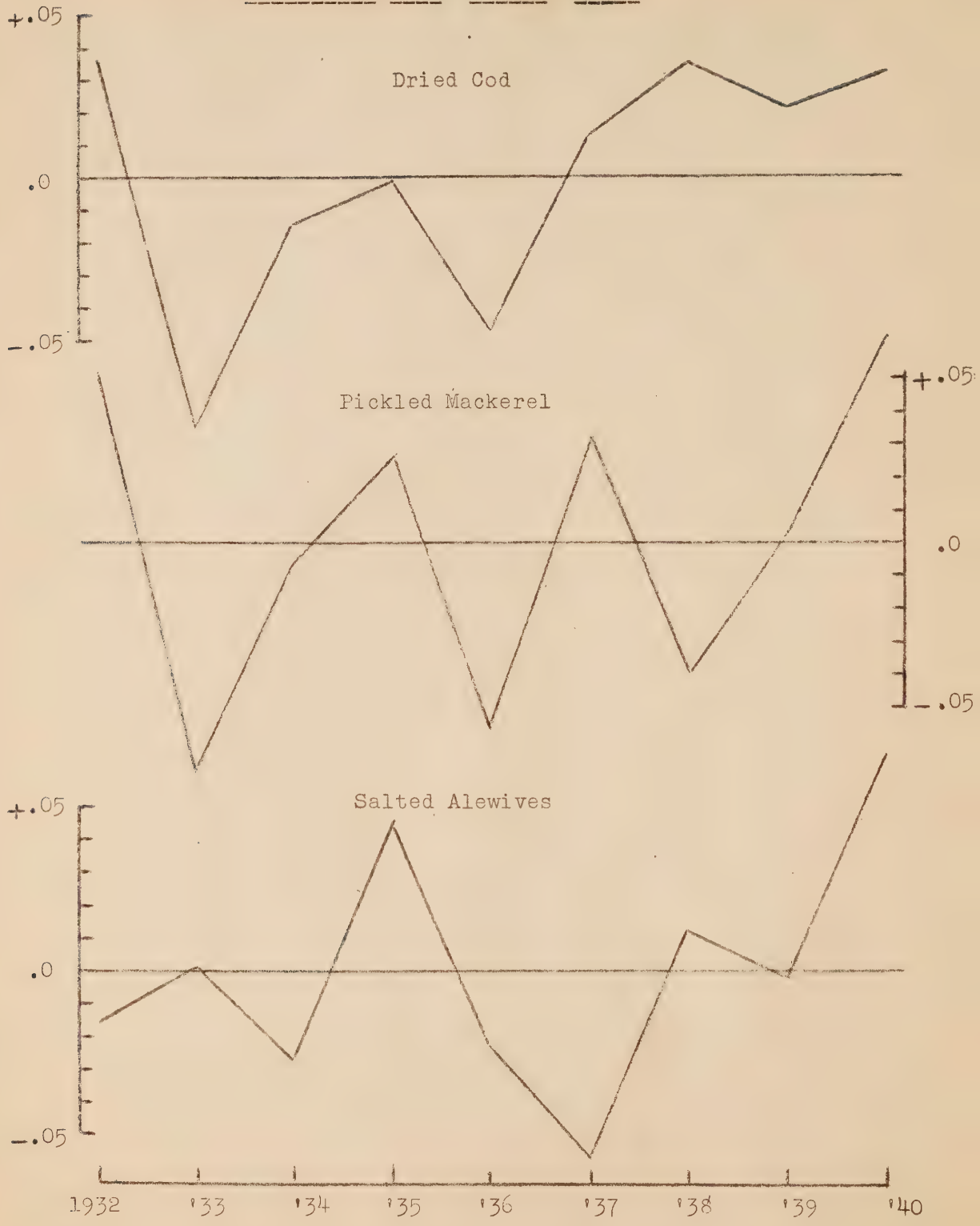
from the Jamaica market as to the appropriate production policy in Canada. About mackerel, some dealers have contended that the market becomes quite elastic at low prices: this is quite true, as we shall show later: when mackerel is imported at very low prices (as for example in the autumn months of the past few years), the demand extended quite rapidly - but at those low levels, the price was not adequate to meet Canadian costs. While the observations of the years 1932-40 indicate that a small catch of mackerel was more valuable than a large one, it does not follow that this conditions is immutable. It is not impossible that changes in the dietetic habits of Jamaica could arise to increase the demand. Such a possibility has always to be looked for in a commodity of this sort which, in the dietary, is not consumed as a single commodity but as part of a dish. In short, mackerel (and other fish) are complementary to certain other foodstuffs, and changes in the prices of the other foods with which fish is consumed, may greatly affect fish consumption, even without any change in fish prices. On this phase of the question - i.e. study of Jamaica's dietetic habits - we have at present no information.

About the competition between the various types of fish more can be said with the information that is

presently available from trade statistics. In Jamaica, while Canada is the sole seller of mackerel, and almost the sole seller of alewives also, it does not follow that she has a monopoly in these varieties, nor that she can follow a monopolist's policy of charging what the "traffic will bear". In fact it can be shown that the price which can be charged for pickled mackerel is directly related to the price that is being paid for dried cod. In this case codfish is of course the determinant: its price is dependent on international conditions. How much codfish (and what qualities) that Newfoundland offers to the Jamaica market is dependent on her ability to sell this fish in other better paying markets. In the decade after 1929 Newfoundland had difficulties in Europe, and Jamaica, and other West India markets remained as areas where Newfoundland fish had to be sold, even at sacrificial prices. Between 1930 and 1939 Newfoundland had doubled her quantities of salt codfish exported to Jamaica. In 1940 (and in 1941) exports to this market contracted. Throughout this period these international conditions really set the price that Canada could get for mackerel in Jamaica. The ratio of the price of mackerel to that of dried cod in Jamaica can never vary much from the ratio in which one of these two fish foods can be substituted for the

Chart 7.

THE JAMAICA MARKET
Deviations from "Normal" Price



other in that Jamaican's food consumption. This ratio is not immutable from year to year - since consumption habits can and do change - but it is remarkably constant indicating a high substitutability between cod and mackerel. A small change in the price ratio of cod to mackerel (say a rise in mackerel price relatively to cod) brings a transfer of many consumers away from mackerel. Just how closely the prices of the two have varied is best seen in the accompanying chart. The same feature is revealed again between mackerel and alewives: if the mackerel price is raised relatively to alewives, consumers are apt to switch their consumption to the cheaper commodity, as for example in 1937-38 season when mackerel prices were raised by 20%: alewives sales rose by 70%, and even herring experienced the shift of consumers away from mackerel. But the competitive relation between mackerel and alewives is not so strong as that between mackerel and dried codfish. The mackerel and alewive prices do not march so closely in line as do the mackerel and cod prices.

The competitive position between the three varieties can be calculated from the experiences of 1932-40. Over this period, a 1% rise in the price of cod relatively to mackerel brought a fall of 1.6% in the sales of cod relatively to mackerel: in short a change in

relative prices brought a much more than proportionate (60%more) change in the relative **quantities sold.** Oppositely a fall of 1% in cod prices relatively to mackerel brought a 1.6% rise in cod sales relatively to mackerel. Hence in the period after 1929, it is easy to see why, when Newfoundland cod prices in Jamaica fell low, mackerel prices had to keep closely in step, for each 1% fall in cod prices would have meant a 1.6% rise in cod sales relatively to mackerel, **unless mackerel prices** kept in line.

Between mackerel and alewives the competition is less keen. A 1% rise in mackerel prices relatively to alewives did of course contract mackerel sales relatively to alewives, but not by as much as above: only by 1.1%. This is simply another, somewhat more precise way of saying that the competition between mackerel and alewives was less keen than between cod and mackerel.

The competition between the varieties was also affected by changes in the national income in Jamaica. If income rose, and there was more purchasing power available, there was increased demand for cod, and also for alewives, but, as already mentioned, little change in demand for mackerel. A 1% rise in national income brought a small increase (0.2%) in the demand for cod as against mackerel. Also a 1% rise in income brought

a rise of 0.3% in the demand for alewives as against mackerel. Oppositely a fall of 1% in income brought a 0.2% fall in cod and a 0.3% fall in alewive demand relatively to mackerel - which suggests another reason why mackerel stood up better to the depression conditions than might have been expected.(1) Oppositely, in boom conditions in Jamaica, if consumption habits remain as they did in the last decade, there would be a rise in demand for cod and alewives relatively to mackerel. To study these habits it would be necessary to investigate the types of dishes in which cod, mackerel and alewives are used, whether the other foods they are mixed with, are altering in their prices, etc.

These then represent the various statistical findings from the experience of the years 1932-40. It should be said that the equations for cod (price and income) represented a very good fit, while those for mackerel and alewives were a little less satisfactory -

(1) See O.F. MacKenzie "Report" p. 23 "Strangely enough, the greatest increase (in mackerel demand) came in the depression years". He attributes this to low prices: but cod and alewive prices also fell. An important factor is that already mentioned: that mackerel demand was independent of income, whereas the demand for the others rose and fell as income rose and fell.

suggesting that in the case of mackerel and alewives the demand was being affected by other variables than merely price and income. We have reason to believe that these unmeasured factors were changes in preferences for mackerel and alewives arising from changes in the prices of the other foodstuffs which are complementary to pickled fish in the Jamaican's dietetic habits.

From the analysis of this and other data, it appears that the amount of mackerel sold depends more on the relative price of mackerel and its substitutes than it does on the economic conditions in Jamaica. At low prices (i.e. under $6.00 per barrel, or $3.00 per cwt), the demand is elastic but not encouragingly so: a large crop sells for little more than a shorter one. At higher prices (i.e. above $7.00 per barrel) the demand contracts rapidly and seems, on available evidence to be inelastic, and a short catch is better than a large one. Of course this elasticity might alter if Canadian exports were more steady throughout the year and if the export prices did not fluctuate so widely as they do. But given the present methods of export, it appears broadly true that a short catch, even from a national point of view is just as good as a large one, so far as this product is concerned. From the

fisherman's point of view, a short catch is very definitely better than a large one. For example if the years 1937 and 1938 are compared it is clear that the short catch of 1937 yielded almost as much generally as the larger 1938 catch; but in 1937 the fisherman received $6.70 per barrel as against $4.60 in the heavier catch year. With the larger catch, the providers of barrels, salt, etc. gain the extra employment, so that the national return from the larger catch is just about the same as from a small catch; but for the fisherman (on average) the short catch is to be preferred.

The last matter to be raised in this connection is that of middleman action. It appears from a study of the sales of the annual mackerel catches from 1930 to 1939, that middlemen(exporters) do not, as they do in many trades, manage to smooth out the sales of the catch through the remaining months of the year. On the contrary, there is a pronounced seasonal movement in the monthly exports, indicating that one of the primary functions of the dealer is not quite being fulfilled.

The nature of the typical or normal seasonal movement (1) is a rapid increase in exports in the two months following the catch, with a steady reduction in exports per month until, just before the new catch

(1) See Appendix (VII).

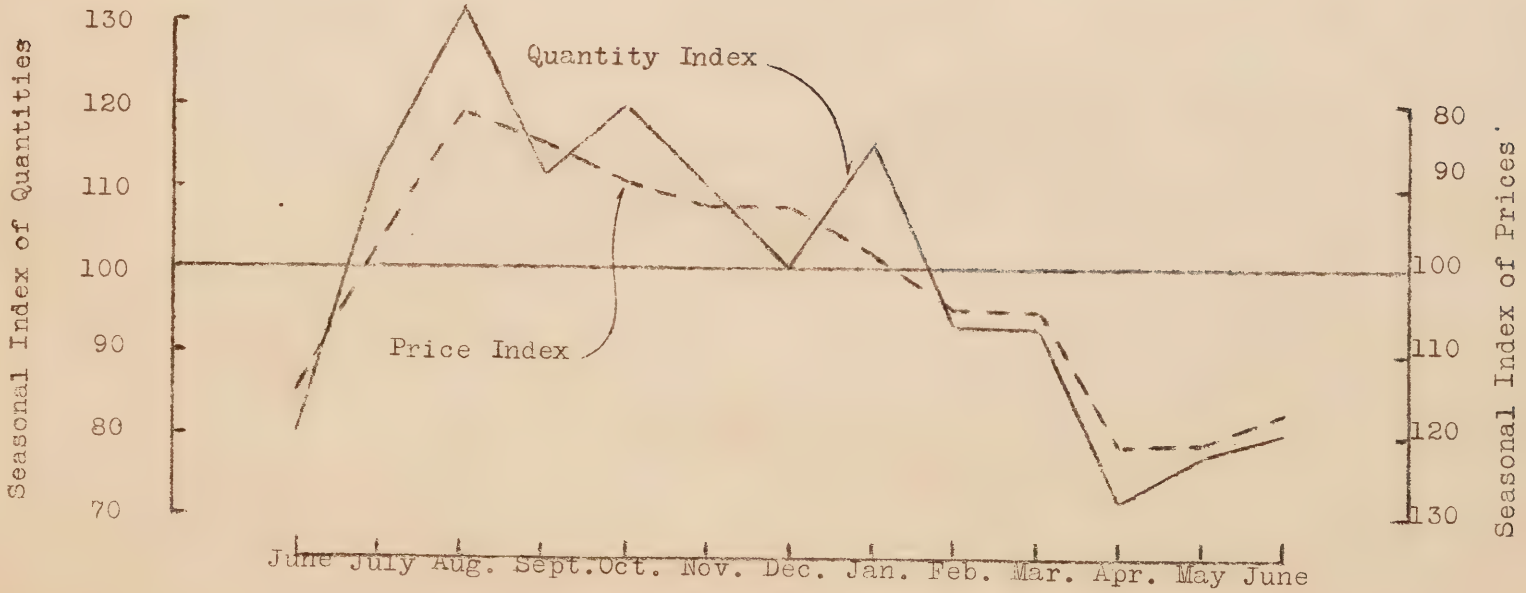
Chart 8.

Normal Seasonal Variation in the

Exports of Pickled Mackerel ("Spring")

Seasonal Indices of Quantities and Prices

(Price Index Inverted)



See Appendix VIc for figures.

arrives, the exports are low. The prices reveal this seasonality also: these (export prices) fall rapidly in the two months following the catch, and then as sales fall off month after month, export prices rise steadily until the new catch arrives. Their normal seasonal movements have been measured and the points are revealed by a glance at chart (8).

More disturbing however is the knowledge that this seasonal swing has been increasing in the past five years.(1)

That there should be a pronounced seasonal swing in exports may have a simple explanation. It may be that as quantities have increased since 1922, dealers have lacked the storage facilities to hold over the larger amounts. Hence the larger sales in July and August following the new catch. It may be also that the dealers in this business lack sufficient capital to tie up funds in stores of mackerel for several months. It may be that the competition among dealers is such that their costs of marketing have risen (as in payment of 5% commission to agents), or that their competition is such that they respond to the Jamaica agents' desire for some speculation through the year, so that they oversell in July and August in order to have short supplies and

(1) See Appendix (V11).

speculative opportunities later in the year (especially in the few months before the next catch). In other words, there may be several explanations of the seasonality.

And if these were valid, they would help to explain also the greater amplitude of the seasonal swings in the last five years, when prices were very low, capital short, and competition keener than ever, especially as some new exporters entered the Canadian scene during this time.

But it appears that Canadian dealers are not entirely blameless, not even blameless of the speculation which appears to take place among Jamaican agents. It is difficult for the onlooker to appreciate the reason for the short sales and high prices of every year from February to May, when there has been a fairly substantial carry-over of mackerel in each year since 1930.(1)

There is some seasonal movement in the export of dried cod also, but it seems to be less marked than in the

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(1) e.g. in 1939 season, there was a carry-over of 12,000 barrels. Yet dealers managed to raise the average export price from $4.82 per barrel in August 1939, to $7.52 in May 1940. (See Appendix (VIII) for prices per cwt or half barrel.) At these higher levels, of course, demand falls off very rapidly.

case of mackerel. This factor would contribute to the competitive strength of cod against mackerel, for the seasonal price variation in mackerel is large: it encourages consumption in late summer and fall, but the rise in price in the spring must definitely discourage many consumers from regarding mackerel as an article of steady consumption. It hints also, as does the fact already mentioned, that there is annually in the mackerel business some speculative activity both in Canada and Jamaica: It is to be expected that opportunities for such activity would be greater in the case of mackerel (in which we are the single seller) than in cod. But the fact remains that there is no monopoly in the case of mackerel for it has to compete with substitutes.

These seasonal variations in mackerel prices (and the size of the carry-over) are affected by the agreements made between exporters. The agreement, so far as it is adhered to, helps to crystallize the seasonal swing: but its success in so doing contributes to the breakdown of the agreement itself - by leaving carry-overs in the hands of single exporters, by creating opportunities for breaking the agreement (in consignment sales, etc.) The knowledge among Jamaican agents that the Canadian price may be broken is an incentive also to speculation on their part: and if it is broken (e.g. a sudden break

in the spring price from $8.00 to say $7.00 per barrel), this hinders good-will in the trading, especially among agents who have bought at higher prices, in good faith that the Canadian exporters would hold to their agreed price.

Appendix 1 (a)

MACKEREL LANDED (Quantities)

Year	Quebec (cwt)	New Brunswick (cwt)	P. E. I. (cwt)	Nova Scotia (cwt)	Total (cwt)
1920	40294	15102	5880	81071	142347
1921	24982	20926	8204	91432	145544
1922	53770	23441	7729	166538	251478
1923	46211	13455	2899	79184	141749
1924	79437	13845	7646	114662	215590
1925	47135	16707	6220	117599	187661
1926	22765	19088	6054	67580	115487
1927	70765	9271	6455	72306	158797
1928	23520	18611	10197	71440	123768
1929	22967	13210	9194	107385	152756
1930	31452	6062	10591	130359	178464
1931	43174	7784	8252	137038	196248
1932	48330	17027	6077	107019	178453
1933	36230	8125	9255	209706	263316
1934	28838	9235	8963	143782	190818
1935	35640	5994	8041	110820	160495
1936	16164	10186	10672	190616	227638
1937	41840	10127	11164	176032	239163
1938	39161	7885	10559	227960	285565
1939	48923	6853	25366	439509	520651

Appendix 1 (b)

MACKEREL LANDED (Value)

Year	Quebec ($)	New Brunswick ($)	P. E. I. ($)	Nova Scotia ($)	Total ($)
1920	174550	73648	22545	512561	783304
1921	107683	69901	26632	574137	778353
1922	192030	89306	41014	825852	1148202
1923	136302	40736	11213	245666	433917
1924	215850	42301	29564	413636	701351
1925	90117	47452	16346	288871	442786
1926	44728	42277	15164	173049	275218
1927	127828	15457	19889	236796	399970
1928	42047	34779	24334	244916	346076
1929	43915	23478	26692	269841	363926
1930	87435	10676	29265	314767	442143
1931	63474	13408	19307	207505	303694
1932	26804	17735	11616	107367	163522
1933	22331	11157	8870	171125	213483
1934	22653	10323	13931	173301	220208
1935	28128	7436	11462	141324	188350
1936	15207	13095	14016	227931	270249
1937	47441	16045	18079	302723	384288
1938	41908	12770	16146	274545	345369
1939	46803	9016	35178	416426	507423

Appendix 11 (a)

MACKEREL PICKLED (Quantity)

Year	Quebec (bbl)	New Brunswick (bbl)	P. E. I. (bbl)	Nova Scotia (bbl)	Total (bbl).
1920	12741	174	828	12401	26144
1921	7583	47	988	10445	19063
1922	14536	12	1087	19179	34814
1923	11602	52	310	10024	21988
1924	11810		1215	17387	30412
1925	14022		968	26086	41076
1926	5873	20	1130	12103	19126
1927	21300	205	1005	16611	39121
1928	6940	50	2016	11915	20921
1929	7214	300	1855	27330	36699
1930	10136	30	2160	35028	47354
1931	13885	5	693	23836	38419
1932	15451	192	501	23103	39247
1933	10306	428	774	46591	58099
1934	8871	929	661	28238	38699
1935	11485	183	594	26509	38771
1936	3099	15	309	38312	41735
1937	9675	9	127	29570	39381
1938	8596	66	180	34426	43268
1939	9225	101	828	56801	66955

Appendix 11 (b)

MACKEREL PICKLED (Value)

Year	Quebec ($)	New Brunswick ($)	P.E.I. ($)	Nova Scotia ($)	Total ($)	Average price per barrel ($)
1920	212832	2488	12966	254738	483024	18.50
1921	118667	564	13103	195234	327568	17.20
1922	174149	240	13315	264956	452660	13.00
1923	85449	848	4601	97316	188214	8.56
1924	121588		17774	253828	393190	12.92
1925	112354		8522	219255	340131	8.30
1926	64923	240	9424	131982	206569	10.79
1927	177271	2050	11130	185820	376271	9.64
1928	69348	500	25302	147475	242625	11.60
1929	68266	2400	26692	254753	352111	9.59
1930	96929	210	29576	305373	432088	9.14
1931	83316	30	6065	170073	259484	6.75
1932	58445	1196	3409	89777	152827	3.89
1933	38843	3640	4780	168876	216139	3.72
1934	47820	4491	6158	194604	253073	6.56
1935	55633	1464	4950	149957	212004	5.47
1936	12850	114	2376	176378	191718	4.59
1937	67318	81	1102	194263	262764	6.69
1938	36144	699	1470	170164	208477	4.84
1939	42874	805	5653	258149	307481	4.59

Appendix 111

CANADA MACKEREL

	Landed (cwt)	Used Fresh (cwt)	Fresh Fillets (cwt)	Canned (cases)	Smoked (cwt)	Pickled (bbl)	Salt Fillets (bbl)	Bait (bbl)
1929	152786	44913	-----	455	24	36699	----	15
1930	178464	35809	-----	469	131	47354	----	--
1931	196248	74334	-----	578	3	38419	1268	995
1932	178453	50097	-----	709	4	39247	278	4583
1933	263316	65822	98	111	25	58099	2661	6086
1934	190818	44208	-----	1716	1	38699	2525	9595
1935	160495	32529	-----	98	---	38771	453	4957
1936	227638	73735	458	402	31	41735	3012	7531
1937	239163	67010	1777	898	60	39381	7312	9344
1938	285565	62312	263	634	40	43268	8631	28814
1939	520651	184345	663	816	255	66955	13903	38474

Appendix IV

CANADA MACKEREL

	Fresh Landings (cwt)	Pickled (bbl)	Pickled in terms of Fresh (cwt)	Proportion of Landings Pickled	Average Price per barrel
1923	141749	21988	65900	47%	8.56
1924	215590	30412	91300	42%	12.92
1925	187661	41076	123000	66%	8.30
1926	115487	19126	57400	50%	10.79
1927	158797	39121	117100	74%	9.64
1928	123768	20921	65900	53%	11.60
1929	152756	36699	110000	2%	9.59
1930	178464	47354	141800	79%	9.14
1931	196248	38419	115200	59%	6.75
1932	178453	39247	117600	66%	3.89
1933	263316	58099	174200	66%	3.72
1934	190818	38699	116000	61%	6.56
1935	160495	38771	116300	73%	5.47
1936	227638	41735	125200	55%	4.59
1937	239163	39381	118100	49%	6.69
1938	285565	43268	129700	45%	4.84
1939	520651	66955	200800	38%	4.59
1940	357354	48442	145300	41%	4.33

Appendix V

PICKLED MACKEREL EXPORTS TO JAMAICA

Canadian Fiscal Years	cwts.	$ value	Average price per barrel ($) F. O. B.
1920	10531	91849	17.44
1921	24188	197938	16.36
1922	9303	72579	15.60
1923	18918	95047	10.04
1924	26842	116898	8.70
1925	24483	158115	12.90
1926	38481	191301	9.94
1927	35676	254043	14.24
1928	32432	190534	11.74
1929	42249	243158	11.50
1930	57664	333946	11.58
1931	65919	347261	10.54
1932	56221	230468	8.18
1933	61986	178299	5.74
1934	68345	177137	5.18
1935	74630	258609	6.92
1936	66646	225167	6.76
1937	73822	214781	5.80
1938	50805	205556	8.08
1939	79003	219633	5.56
1940	81271	240244	5.90

Appendix VI

JAMAICA

Fish Imports

year	Dried Cod £	Pickled Mackerel £	Salted Alewives £	National Income (i.e. Total Exports from Jamaica) £
1932	198765	56869	9335	3137000
1933	152306	43687	7531	2397000
1934	172973	60518	7523	3068000
1935	186814	53978	7595	3691000
1936	170990	47068	6720	3698000
1937	189364	53263	11368	4817000
1938	212180	50848	12320	4926000
1939	202884	59355	8983	4638000
1940	180416	68951	14434	3041000

Appendix V11

TYPICAL OR NORMAL SEASONAL FLUCTUATIONS IN EXPORTS OF MACKEREL TO JAMAICA

	Seasonal variation in exports (1930-40 base).	Seasonal variation in exports (base 1935-40).	Seasonal variation in export price (F.O.B.) 1930-40 base.
Jan.	113	79	98
Feb.	71	74	103
Mar.	116	101	104
Apr.	71	58	111
May	74	56	112
June	80	73	108
July	111	144	99
Aug.	130	167	91
Sept.	111	120	93
Oct.	118	110	94
Nov.	108	142	95
Dec.	101	75	96

Note: The regularity of the seasonal fluctuations is upset in February and March, due to the fact that fortnightly sailings often occur only once in the short February month, with three sailings in the March following. This factor greatly lowers the February index and raises the March index.

In chart 8 account has been taken of this bias in the monthly statistics and it has been drawn with a correction to compensate for the accidental variation arising out of sailing dates.

Appendix V111

MONTHLY EXPORTS OF PICKLED MACKEREL TO JAMAICA

Average price per cwt. (F.O.B. price)

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Jan.	5.84	4.86	4.18	2.45	2.39	4.53	3.17	2.75	3.86	2.69	3.18
Feb.	6.87	4.95	4.13	2.50	2.52	4.63	3.27	3.14	3.75	3.00	3.50
Mar.	6.77	4.97	4.08	2.62	2.59	4.61	3.09	3.55	3.31	3.33	3.14
Apr.	7.29	5.13	4.05	3.05	2.57	4.34	3.17	4.97	3.50	3.53	3.56
May	7.15	4.95	3.90	3.14	2.55	4.54	3.12	5.44	3.37	3.41	3.76
June	7.46	4.54	3.82	3.15	2.57	4.48	3.18	4.70	3.00	3.16	3.09
July	5.44	4.08	3.36	2.94	2.69	3.60	3.24	4.38	2.57	2.77	2.89
Aug.	4.93	3.98	2.75	2.48	3.07	2.90	2.57	4.01	2.49	2.41	2.40
Sept.	5.10	3.42	2.73	2.49	3.80	2.90	2.74	3.93	2.51	2.28	
Oct.	4.77	3.79	2.61	2.46	4.59	2.86	2.50	4.11	2.52	2.76	
Nov.	4.71	4.05	2.59	2.43	3.24	2.86	2.50	3.96	2.48	2.98	
Dec.	4.37	4.13	2.52	2.38	4.62	3.21	2.50	3.88	2.62	3.17	